

Response to Reviewer 3 Comments

Point 1: Does the simulation system involve input parameters ? How are they identified or collected ? Please briefly explain.

Response 1: Many thanks for pointing out this, the execution parameters are more highlighted and detailed. Find for example in Section 4.1 in line 482.

“The Figure 19 is given by the simulation result on the Wake-up radio chip based on AS3933 after entering the according sensitivity and transition interval which are provided by the non-linear regression error function in section 3.2 – -59.55dBm of sensitivity and around 3.01 dB of transition interval –“

The simulation system involves different parameters that can be configured by the user in the INI file of the OMNeT++ simulator. Such as the transition interval and the sensitivity for the PER module and also for the RSSI module that integrate the RSSI, attenuation factor, d_0 , and the distribution level (see Figure 18 and 23) that describe each module and its parameters.

Point 2: Several algorithms have been mentioned many times, which can be briefly explained in the paper, such as ML algorithm based on supervised learning, RSSI-based ranging algorithm, etc.

Response 2: Many thanks for pointing out this. A revision has been made to include the definition of parameters that uses the non-linear regression used by the mathematical function $\text{erf}()$ and to briefly explain some mentioned algorithms, such as the RSSI-based ranging method. Such in line 248 we briefly explain the RSSI based ranging algorithm. Or for the case of the ML that uses non-linear regression mathematical models

“In most cases, the RSSI based ranging algorithm employed the shadowing model, and it is used nowadays in localization-based algorithms, that use the trilateration method, this method needs the presence of three nonlinear reference points that are represented by three transmitters. A node applies RSSI measurements to approach its distances from the received packets[30].”

Point 3: The OMNeT++discrete event simulator mentioned in this paper has some limitations. Can you specify its limitations and improvement methods ?

Response 3: Many thanks for pointing out this. Considering the OMNeT++ discrete event simulator limitations, it lacks observing of some metrics, especially for new WSN protocols such as the WuRx. One of the objective of this work is the integration of those metrics after an exhaustive measurement. This is highlighted in the end of Section 2.1

“But also OMNeT++ discrete event simulator has some limitations, it lacks observing of some metrics, especially for new WSN protocols such as the WuRx. The main

objective of this work is the integration of those metrics after an exhaustive measurement.”

Point 4: Please confirm that Section 2.4 contains only one sub-section. Integrating Section 2.4.1 into Section 2.4 or splitting it will make the article look more concise and easy for readers to understand.

Response 4: Many thanks for pointing out this. The organization of the section 2.4. It has been already corrected and sets it right.

Point 5: Two papers about network routing should be cited:

[1] Traffic dynamics on multilayer networks with different speeds. IEEE Transactions on Circuits and Systems II: Express Briefs. 2022, 69(3): 1697 - 1701.

[2] An improved optimal routing strategy on scale-free networks. IEEE Transactions on Circuits and Systems II: Express Briefs. 2022, 69(11): 4578 - 4582.

Response 5: The paper bibliography has been updated, many recent references have been mentioned among them the two mentioned publications, which I found them very interesting and related to the work objectives. The ideas also can be deployed for More Routing algorithms and scalability for Energy Neutral Operation in future work in the WuRx model in the simulator. You will find it in line 292.

“The physical study of the software and the hardware link quality metrics in this article has proven an important role in network reliability optimization in many articles, and multiple strategies can be adopted in future work for more investigation into the scalability process of the network such as in [38] that proposed a simulation for a proposed approach for improved routing, or in the [39] that cite the optimization of some real traffic or communication networks to control the congestion.”

Point 6: The fifth section briefly summarizes the work of the previous section, which makes the paper seem slightly redundant and repeats with the end of the introduction of the first section. I suggest you rearrange the structure of the paper.

Response 6: Many thanks for pointing out this. Regarding the summary, it has been shortened and modified in a way that gives a general overview of the whole proposed work, the conclusion is dedicated to a general glossary and opens new horizons for future work and perspectives.

Point 7: What causes the attenuation in the simulation, what factors are simulated in the real environment, and how to control the attenuation? Please answer briefly.

Response 7: Many thanks for pointing out this. The RSSI module integrates multiple parameters among those parameters we can find the attenuation factor for example, which could cause the attenuation in the simulation.

Finally I would like to thank you for your efforts and time to provide those remarks, I have the proposed modification are sufficient for publication and I am ready for further clarifications and answers.